

WHAT IS CLAIMED IS:

1. An oscillator circuit for performing oscillation by positive feedback of an LC resonant circuit, wherein  
said LC resonant circuit includes a parallel resonant circuit formed of an inductance-variable portion allowing variation of an inductance by a switch circuit and a capacitor element.

2. The oscillator circuit according to claim 1, wherein  
said inductance-variable portion includes  
first and second input/output terminals,  
a spiral interconnection layer starting from said first input/output terminal, and formed on a semiconductor substrate with an interlayer insulating film therebetween, and  
a plurality of switch circuits having first terminals connected to arbitrary positions on said interconnection layer, and having second terminals commonly connected to said second input/output terminal, and  
when one of said plurality of switch circuits is turned on, the position on said interconnection layer connected to said turned-on switch circuit is electrically coupled to said second input/output terminal.

3. The oscillator circuit according to claim 2, wherein  
said inductance-variable portion further includes a plurality of second switch circuits each having a first terminal connected to the first terminal of one of said plurality of switch circuits, and having a second terminal connected to the first terminal of another one of said plurality of switch circuits, and  
when one of said plurality of switch circuits and one of said plurality of second switch circuits are turned on, the position on said interconnection layer connected to said turned-on switch circuit is electrically coupled to said second input/output terminal.

4. The oscillator circuit according to claim 1, wherein

said inductance-variable portion includes  
first and second input/output terminals,  
a plurality of spiral interconnection layers starting from said first  
5 input/output terminal, and formed on a semiconductor substrate with an  
interlayer insulating film therebetween, and  
said plurality of switch circuits connected between trailing ends of  
said plurality of interconnection layers and said second input/output  
terminal, respectively, and  
10 when one of said plurality of switch circuits is turned on, the trailing  
end of said interconnection layer included in said plurality of  
interconnection layers and connected to said turned-on switch circuit is  
electrically coupled to said second input/output terminal.

5. The oscillator circuit according to claim 3, wherein  
said switch circuit includes a transistor element to be turned on/off  
in accordance with a voltage level of a control voltage.

6. The oscillator circuit according to claim 1, wherein  
said capacitor element in said LC resonant circuit has a variable  
capacitance value.

7. An oscillator circuit, comprising:  
a pair of transistors cross-coupled to each other; and  
an LC resonant circuit of a differential type coupled to said pair of  
transistors in a feedback manner; wherein  
5 said LC resonant circuit includes  
first and second inductance-variable portions including first and  
second input/output terminals, said second input/output terminals being  
commonly connected to a fixed node, and said first and second inductance-  
variable portions being capable of varying inductances, and  
10 a first switch circuit coupled between the first input/output terminals  
of said first and second inductance-variable portions,  
each of said first and second inductance-variable portions has

a spiral interconnection layer starting from said first input/output terminal and formed on a semiconductor substrate with an interlayer insulating film therebetween, and  
15 a plurality of second switch circuits having first terminals connected to arbitrary positions on said interconnection layer and second terminals commonly connected to said second input/output terminal, respectively, when one of said plurality of second switch circuits is turned on, the  
20 position on said interconnection layer connected to said turned-on second switch circuit is electrically coupled to said second input/output terminal, and when said first switch circuit is turned on in response to the turn-on of said second switch circuit, said first switch circuit electrically couples  
25 said first and second inductance-variable portions.

8. An oscillator circuit, comprising:  
a pair of transistors cross-coupled to each other; and  
an LC resonant circuit of a differential type coupled to said pair of transistors in a feedback manner; wherein  
5 said LC resonant circuit includes first and second inductance-variable portions including first and second input/output terminals, said second input/output terminals being commonly connected to a fixed node, and said first and second inductance-variable portions being capable of varying inductances, and  
10 a first switch circuit coupled between the first input/output terminals of said first and second inductance-variable portions, each of said first and second inductance-variable portions has a plurality of spiral interconnection layers starting from said first input/output terminal and formed on a semiconductor substrate with an  
15 interlayer insulating film therebetween, and a plurality of second switch circuits coupled between trailing ends of said plurality of interconnection layers and said second input/output terminal, respectively, when one of said plurality of second switch circuits is turned on, the

20 trailing end of said interconnection layer included in said plurality of  
interconnection layers and connected to said turned-on second switch  
circuit is electrically coupled to said second input/output terminal, and  
when said first switch circuit is turned on in response to the turn-on  
of said second switch circuit, said first switch circuit electrically couples  
25 said first and second inductance-variable portions.

9. The oscillator circuit according to claim 7, wherein  
said first and second inductance-variable portions form a differential  
inductor element.

10. The oscillator circuit according to claim 7, wherein  
each of said first and second switch circuits includes a transistor  
element to be turned on/off in accordance with a voltage level of a control  
voltage.

11. The oscillator circuit according to claim 7, wherein  
said capacitor element in said LC resonant circuit has a variable  
capacitance value.

12. An L load differential circuit, comprising an inductor pair  
including first and second inductance-variable portions having second  
input/output terminals commonly connected to a fixed node and being  
capable of varying inductances, and a first switch circuit coupled between  
5 first input/output terminals of said first and second inductance-variable  
portions, wherein

each of said first and second inductance-variable portions has  
a spiral interconnection layer starting from said first input/output  
terminal and formed on a semiconductor substrate with an interlayer  
10 insulating film therebetween, and  
a plurality of second switch circuits having first terminals connected  
to arbitrary positions on said interconnection layer and second terminals  
commonly connected to said second input/output terminal, respectively,

when one of said plurality of second switch circuits is turned on, the  
15 position on said interconnection layer connected to said turned-on second  
switch circuit is electrically coupled to said second input/output terminal,  
and

when said first switch circuit is turned on in response to the turn-on  
of said second switch circuit, said first switch circuit electrically couples  
20 said first and second inductance-variable portions.

13. An L load differential circuit, comprising an inductor pair  
including first and second inductance-variable portions having second  
input/output terminals commonly connected to a fixed node and being  
capable of varying inductances, and a first switch circuit coupled between  
5 first input/output terminals of said first and second inductance-variable  
portions, wherein

each of said first and second inductance-variable portions has  
a plurality of spiral interconnection layers starting from said first  
input/output terminal and formed on a semiconductor substrate with an  
interlayer insulating film therebetween, and  
10

a plurality of second switch circuits coupled between trailing ends of  
said plurality of interconnection layers and said second input/output  
terminal, respectively,

when one of said plurality of second switch circuits is turned on, the  
15 trailing end of said interconnection layer included in said plurality of  
interconnection layers and connected to said turned-on second switch  
circuit is electrically coupled to said second input/output terminal, and

when said first switch circuit is turned on in response to said turn-on  
of said second switch circuit, said first switch circuit electrically couples  
20 said first and second inductance-variable portions.